



Baumgaertner, H., Mullan, S. M., & Main, D. C. J. (2016). Assessment of unnecessary suffering by veterinary experts. *Veterinary Record*, 179(12), [307]. <https://doi.org/10.1136/vr.103633>

Peer reviewed version

License (if available):  
Unspecified

Link to published version (if available):  
[10.1136/vr.103633](https://doi.org/10.1136/vr.103633)

[Link to publication record in Explore Bristol Research](#)  
PDF-document

This is the author accepted manuscript (AAM). The final published version (version of record) is available online via BMJ at <http://veterinaryrecord.bmj.com/content/early/2016/06/28/vr.103633.short?rss=1>. Please refer to any applicable terms of use of the publisher.

## University of Bristol - Explore Bristol Research

### General rights

This document is made available in accordance with publisher policies. Please cite only the published version using the reference above. Full terms of use are available: <http://www.bristol.ac.uk/red/research-policy/pure/user-guides/ebr-terms/>

## **Assessment of unnecessary suffering by veterinary experts**

Baumgaertner, H., Mullan S. and Main, D.C.J.

### **Abstract**

Veterinary surgeons are often asked to provide reports to courts describing factual observations and their expert opinion on the presence or absence of unnecessary suffering in animals. This study reviewed 42 expert witness reports in order to describe the approach taken to the assessment of unnecessary suffering. Whilst most reports suitably described factual observations, there was significant variation in the opinions on suffering and the actions of the owner. Severity and duration of potential suffering was commented upon in 26 and 29 reports respectively. Experts used terms associated with negative mental states and physical states in 28 and 27 reports respectively. The necessity of suffering was commented upon in 27 reports, with minimal commentary on the actions of the owner. External references supporting the opinion of the expert was only provided in 13 reports. There was evidence of disputes between experts concerning the definition of suffering, the significance of clinical findings and the relevance of different assessment methods. It is suggested that expert witness reports should include a systematic consideration of the animal's mental and physical states, severity of harm, duration of harm and a commentary on the necessity of suffering as defined by legislation.

### **Introduction**

Veterinary surgeons are often asked to act as witnesses in cases of alleged unnecessary suffering, sometimes referred to as animal cruelty cases (Benetato and others, 2011, Cooper and Cooper, 2008). Veterinary surgeons may be asked to testify about observed facts, such as reporting the results of a clinical examination. Veterinary surgeons may also be asked to act as expert witnesses and provide an opinion to the Court. The obligations of veterinary surgeons and nurses in the UK providing either factual or opinion evidence is described in the RCVS Code of Professional Conduct (RCVS, 2015). Experts can give opinions provided they have relevant *"knowledge, experience or formal qualifications"*. Even though expert witnesses are usually asked to attend and are paid for by the defence or prosecution lawyers, their *"primary responsibility or overriding duty is to the Court"* and they must at all times *"remain objective, impartial, independent, and to act with integrity"* (RCVS 2015).

Experts asked for their opinion on unnecessary suffering under Section 4 of the Animal Welfare Act (2006) are required to comment on the presence of suffering in the animal and/or on the actions of the relevant keeper.

The Animal Welfare Act (2006) includes a relatively specific list of considerations to determine whether suffering was unnecessary. These include whether suffering could have been “avoided or reduced”, whether actions were in conformation with a code of practice, whether the actions were for a “legitimate purpose”, whether suffering was “proportionate to the purpose” and whether the conduct of the keeper was that of a “reasonably competent and humane person”. This list is based on considerations that arose through case law of earlier legislation that used a test of ‘unnecessary suffering’ prior to the Animal Welfare Act (2006) (Radford, 2001).

In contrast suffering is more loosely defined in the Animal Welfare Act (2006) where guidance is given that *“physical or mental suffering and related expressions shall be construed accordingly”*. Failing a more precise definition, Martin (2013) suggested that many veterinarians acting as expert witnesses use the Oxford English Dictionary definition of suffering; *“the bearing or undergoing of pain, distress or tribulation”*.

The lack of consensus on the meaning of suffering is also seen in the scientific literature (Table 1). Suffering in animals can originate from many sources. Webster (2005) suggests that it can arise from primitive feelings such as hunger, thirst, heat, cold, pain, fear and exhaustion, and higher feelings such as frustration, boredom, loneliness and depression. Whilst agreeing that animals may have the capacity to suffer, many welfare scientists highlight the difficulties of defining and assessing suffering (Mason & Mendl 1993; Würbel 2009; Bateson 2011). This difficulty of assessment has long been recognised in humans with Cassell (1982) arguing that the diagnosis of suffering in human medicine primarily depends on the individual and potential threat to a person’s integrity.

**Table 1: Examples of different definitions used for 'suffering'**

Quote	Reference	The difficulty in defining and assessing suffering is likely to
“essentially the extended experience of negative feeling in the spectrum from pain, though malaise, to frustration”	Fraser 1984; 1988	
“strong, negative affective states such as severe hunger, pain, or fear”, “experiencing intense and prolonged unpleasant states”	Fraser & Duncan 1998	
“the physical and emotional syndrome that develops as a result of unrelieved severe pain”	Short 1998	
“experiencing one of a wide range of extremely unpleasant subjective (mental) states” “a set of negative emotions such as fear, pain and boredom, and recognized operationally as states caused by negative reinforcers.”	Dawkins 1985 Dawkins 2008	
““suffering” means physical or mental suffering and related expressions shall be construed accordingly;”	Animal Welfare Act (2006)	
“the bearing or undergoing of pain, distress or tribulation”	Oxford English Dictionary (quoted in Martin, 2013)	

contribute to inconsistencies in the legal process. Previous authors have highlighted inconsistencies in the legal process by suggesting that *"courts may come to different conclusions upon similar facts"* (Radford, 2001) and that *"there is significant room for ambiguity and subjective interpretation within the statutes"* (Calley, 2011). An independent review of the prosecution activity of the Royal Society for the Prevention of Cruelty to Animals (RSPCA) by Stephen Wooler (2014) suggested that there was *"no commonality to the approach nor apparently a commonly recognised professional standard"* amongst expert witnesses which was likely to be *"a source of ongoing contention and mutual criticisms."*

The aim of this study is, therefore, to better understand the variability in approach used by expert witnesses to assess unnecessary suffering. It is hoped that this will enable veterinary surgeons and others acting as an expert witness to develop a more consistent systematic approach to the assessment of unnecessary suffering.

## **Materials and Methods**

### ***Collation of reports***

In total, forty-two expert witness reports were gathered from different sources including twenty-four from the RSPCA, five from the Animal and Plant Health Agency (APHA) and sixteen directly from individual expert witnesses known to the authors. Three additional reports recruited from the same sources were excluded from the analysis as the experts were asked to comment upon liability rather than with animal welfare conditions. The relevant legislation in each case concerned the Sections 4 (unnecessary suffering) and 9 (animal welfare) offences of the Animal Welfare Act (2006) or for older cases the unnecessary suffering offence of the Protection of Animals Act (1911).

### ***Analysis of reports***

The reports were anonymized and handled confidentially. A summary of the reports examined, including details of the number, species and consequences for the animal as outlined in each report, is shown in Table 2. Some quantitative information (summarised in Table 3) on the assessment process and findings were collected from a review of the reports. For example it was possible to determine if the opinion was based on direct observation of the affected animal or from submitted evidence. The expert's opinion on the presence of suffering was collated from the reports. Where described, this included the type (mental or physical), severity (i.e. degree) and duration of suffering. The presence of mental suffering was attributed to a report using emotion related terms in the report such as *"terrified"* or *"painful"*. The category of physical suffering was attributed to reports using non-emotion related states such as *"injury"* or *"disease"*.

Animal welfare legislation confers duties on all those responsible for the care of the animals. This may be a temporary keeper as well as the owner. For convenience, the term owner is used in throughout this paper to describe the person responsible for each case. Information on the alleged actions, including lack of action, and, where stated, the necessity of the actions of the owner were collected. Where described in the report, it was noted how the experts justified their specific conclusions beyond their reliance on their previous veterinary experience and knowledge. This included the use of external references, such as academic journals, textbooks, internet sources or Codes of Recommendation.

In addition to the quantitative information the reports were reviewed in order to identify any common themes in the assessment process or formulation of an opinion. These are reported under the overall categories of “assessment of suffering”, “assessment of actions of the owner”, “use of references” and finally “disputes between experts”. Where quotes are given in the text, each is annotated by the relevant code used in Table 2 (R1, R2 etc).

## Results

### *Description of reports*

A summary of the reports and the cases involved is shown in Table 2. Overall, 36 different cases were discussed within the 42 reports. Eleven reports arose from 5 cases that were considered by more than one expert. Two reports were based on the joint opinion of two experts. While 16 cases discussed one animal, 12 cases involved 2 to 10 animals and 7 cases involved more than 10 animals, including one case that involved 154 animals. The most common species involved were cats and dogs (6 cases each) and cattle and sheep (4 cases each). Seven cases involved animals of more than one species. Other cases involved rabbits (3 cases), horses (2 cases) and individual cases of fish, wild mammals, birds and reptiles. Twenty-two cases (24 reports) involved deaths, including euthanasia, of at least one animal.

**Table 2.** Summary of animals affected and the reported impact on the animal within each report.

Report code *	Expert code	Species (Number affected) **	Impact on the animal	Outcome
R1	A	Cow	Ingrown horn	N
R2	A	Sheep	Vision impairment	N

R3	B	Dogs (8)	Cold and shivering	N
R4	C	Horses (7)	Malnourishment, skin condition	D
R5	C	Sheep	Disease	D
R6	D	Dogs (>100)	Dehydration, pain, disease, injury	D
R7	E	Rabbit	Dehydration, starvation	D
R8	E	Dog	Deterioration	D
R9	F	Mixed (5)	Painful face injury	N
R10	G	Mixed (2)	Physical pain, distress	D
R11	G	Fish (4)	Pain	D
R12	G	Dog	Starvation, dehydration	D
R13 <sup>a</sup>	H	Horses (3)	Emaciation and disease	N
R14	I	Mixed (154)	Disease, depression, emaciation	D
R15 <sup>b</sup>	I	Mixed (16)	Disease, depression	D
R16	J	Rabbits (2)	Malnourishment, disease	D
R17	K	Mixed (11)	Malnourishment, disease	D
R18	L	Rabbit	Weight loss, ear infection	D
R19	M	Wild mammal	Drowning	D
R20	N	Birds (28)	Stress, depression, injury	N
R21	O	Reptiles (8)	Starvation, emaciation	D
R22 <sup>c</sup>	P	Cats (20)	Emaciation, parasitic infestation	N
R23 <sup>c</sup>	P	Cats (22)	Emaciation, parasitic infestation	N
R24	Q	Mixed (8)	Starvation	N
R25	R	Cat	Injuries	D
R26	S	Dogs (8)	Good conditions	N
R27 <sup>c</sup>	T	Cats (20)	-	N
R28 <sup>b</sup>	U	Mixed (16)	Poor hygiene standards, disease	D
R29 <sup>a</sup>	U	Horses (3)	-	N
R30 <sup>d</sup>	V	Cat	Injury	N
R31	V	Cats (50)	Poor conditions	N
R32	V	Mixed (13)	Unsatisfactory environment	D
R33	V	Dog	Disease	N
R34 <sup>d</sup>	W	Cat	Injury	N
R35	W	Cows (3)	Pain	N
R36	X	Sheep	Fly strike	N
R37	X & G	Cats (2)	Injuries	D
R38 <sup>e</sup>	X	Cow	Disease	D
R39	X	Cats	Disease/infection	D
R40	X	Sheep	Fly strike	D
R41	X	Cow	Lameness	D
R42 <sup>e</sup>	X & Y	Cow	Disease	D

\* report with same superscript are reports from the same case

\*\* Mixed species if more than one species included in each report

- no impact described

N = Not died, D = Died or euthanased

A summary of the assessment process included in the 42 reports is shown in Table 3. Seventeen of the reports were written by the case vets who reported factual observations because they had either been present at the time of s of the animal(s) or presented with the animal(s) at their practice. Eighteen reports were based on

observation of photographs or video material. Two reports had been written after the witness had performed a post-mortem of the animal in question. The remaining 5 reports were based on reviewing the evidence such as other expert witness reports. A summary of the opinions included in the reports is included in Table 3.

**Table 3.** Assessment process and opinions provided in the reports (n=42)

Category		Number of reports (n=42)
Observation	Observed live animal directly	17
	Observed photo and/or video material	18
	Observed dead animal	2
	Did not observe animal	3
	Not clear, uncertain or not stated	2
Suffering	Reported suffering present in all animals assessed	28
	Reported suffering present in some of animals assessed	6
	Reported no suffering present	3
	Reported that animal was likely to suffer	1
	Not clear, uncertain or not stated	4
Mental suffering	Described presence of negative mental state	28
	No negative mental state present	3
	Not clear, uncertain or not stated	11
Physical suffering	Described presence of negative physical state	27
	No negative physical state present	5
	Not clear, uncertain or not stated	10
Severity (degree)	Described severity of harm	26
	No severe negative state present	3
	Not clear, uncertain or not stated	13
Duration	Described prolonged nature of harm	28
	Not prolonged harm	1
	Not clear, uncertain or not stated	13
Alleged action of keeper	Neglect	30
	Intentional act	5
	Not applicable (keeper not at fault)	5
	Not clear, uncertain or not stated	2
Unnecessary	Reported as unnecessary for at least one animal	24
	Reported as necessary for all animals	3
	Not clear, uncertain or not stated	15
External references	Used external references in report	13
	Did not quote external reference in report	29
Welfare codes	Used welfare codes in report	13
	Did not quote welfare code in report	29

Experts had different sources of evidence available to them, and consequently used different methods to make their conclusions. For example, observations were based on behaviour, physical condition and laboratory-based results.

Example of a behaviour observation: *“The face was very painful to touch and the dog would not allow examination of his face”* (R9)

Example of a physical appearance: *“The skin was extremely adherent to the underlying tissues and I would assess him as being 5-10% dehydrated”* (R15)

Example of a laboratory results: *“Lack of evidence of pathology on the rest of the results that could support liver inflammation or damage is consistent with lack of access to food”* (R24)

### ***Assessment of ‘suffering’***

The potential sources of suffering (i.e. the impact on the animal) varied greatly and are summarised in Table 2. Suffering was concluded to have occurred in at least one animal in 34 reports. Three reports did not find the animals to be suffering and one report stated that the animals were likely to suffer in the future. Four reports did not include an opinion on suffering.

While the AWA defines suffering as both “physical or mental suffering and related expressions shall be construed accordingly” (AWA 2006), there was variable use of physical and mental related suffering within the reports. Twenty-eight reports mentioned terms linked to mental states such as *“distressed”, “depressed”, “terrified”, “painful”* and *“discomfort”*. Three reports stated that there was no mental suffering and eleven reports did not make explicit reference to mental states. Terms related to physical states such as *“dehydration”, “starvation”* and *“injury”* were mentioned in 27 reports. Five reports reported that there were no physical abnormalities and 10 reports did not comment on physical abnormalities. In total, 19 reports concluded there was both mental and physical suffering present.

Some experts linked the suffering with specific medical conditions:

Example of link with a condition: *“may have been suffering from constipation”; “suffering from otitis externa”* (R17)

Others used it as a consequence of a situation an animal was in:

Example of link with environment: *“had been subjected to unnecessary suffering as a result of not receiving an adequate diet”* (R4)

Some used it in a legal sense by referring to the AWA:



Example of reference to law: *“were caused to suffer unnecessarily as defined by section 4 of the Animal Welfare Act 2006”* (R10)

Two experts quoted other definitions of suffering. One expert referred to a legal judgement that explicitly includes brief aversive events within unnecessary suffering cases:

*Lord Hunter’s definition “[unnecessary suffering] imports the idea of the animal undergoing, for however brief a period, unnecessary pain, distress or tribulation”* (R7,8)

In another case the expert referred to two definitions of suffering. These include concepts of a threshold for suffering related to both duration (“greater than minor transient”) and severity (“at a level not tolerated by the individual”) :

*“Suffering in an animal is defined as anything significantly greater than minor transient discomfort”;*  
*“Kirkwood: A severe emotional state that is extremely unpleasant that results [from]<sup>1</sup> physical pain and/or discomfort at a level not tolerated by the individual”* (R27)

One expert referred to the concept of critical anthropomorphism (Morton and others, 1990) to inform their opinion by asking the following:

*“How would we feel if it was us in that situation combined with our knowledge of the gross pathology of tissue penetration, of the nerve innervation in that area for cattle, its ability to have conscious thought and, in certain circumstances, how the animal may react and behave.”* (R1)

Severity and duration were also looked at closer within the analysis of the reports. In total, 29 reports discussed the severity of unpleasant conditions or suffering itself. Out of these, 26 stated that it was severe; three concluded that the suffering was not severe and thirteen did not comment on the severity.

Example of severity: *“the levels of pain and suffering that the cats will have endured are very severe”* (R37)

Discussion of the duration of suffering was included in 29 reports, where 28 stated that the suffering was prolonged and one that it was not. Thirteen reports did not discuss duration. Following are some examples:

---

<sup>1</sup> Changed from “in” to “from” to be in line with original source Radford (2001)

Example of duration: *“the period of suffering must extend to several days at the very least”* (R21)

Some reports implied that there was a threshold above which an animal’s condition was considered suffering.

Example of a threshold: *“The degree of dehydration is again indicative of the lack of care tipping beyond not meeting the animal’s needs into causing suffering”* (R21)

### **Assessment of actions of the owner**

Thirty reports described neglect as the cause for suffering, which was usually expressed as a failure of meeting certain needs such as veterinary care or an adequate diet. Five reports discussed intentional acts as the reason for suffering. The necessity of the suffering was commented upon in 27 reports. Experts stated that the suffering was unnecessary in 24 reports with three reporting that the suffering was necessary for all the animals.

In fifteen reports the necessity of actions taken (or not taken) by the owner was not clear or not stated, including two reports that explicitly stated that they were uncertain. As previously discussed the Animal Welfare Act (2006) includes a list of considerations when deciding if the suffering is unnecessary including whether the actions were *“for a legitimate purpose”* and whether the actions were *“that of a reasonably competent and humane person.”* Considering experts may be in a position to comment upon the technical aspects of these considerations, it is surprising that there was limited discussion of these issues in reports. However, eight reports did comment upon whether the actions of the owner were in line with the actions of other owners (i.e. common practice).

Example of reference to reasonable owner: *“I consider that the condition of the dog was such that any reasonable owner or carer would or should have noted it and realised that this was not normal and that the dog was in need of veterinary care and attention”* (R8)

Example of common practice: *“Most cats have fleas or have encountered fleas. The presence of fleas in a house or on an animal is a poor sole indicator of welfare and suffering”* (R27)

### **Use of references**

When reaching an opinion about unnecessary suffering, a variety of approaches were used. Implicit in the reports was an assumption that the opinions of the experts were informed by their professional qualifications and experience. Expert witnesses are also advised that *“relevant sources of evidence or literature cited or relied upon should be included in the bibliography”* (RCVS, 2015). It is surprising, therefore, that only 13 reports

provided any external reference, not including welfare codes, with most of these reports containing fewer than 5 references except for two reports that provided an extensive reference list in response to a specific request. Some experts referred to scientific evidence being available but did not quote the reference in the report.

An example of using references included a report commenting on the euthanasia of animals by drowning. The expert referred to the opinions of organisations, such as BSAVA, and to scientific literature.

Example of scientific evidence: *“Luther and others (1999) reviewed the evidence for the deficit in oxygen, the build up of carbon dioxide and the appearance of chemical markers for stress in animals that had been forcefully drowned in experiments. The conclusions were clear: [...]”* (R19)

Thirteen reports referred to Codes of Recommendation for the Welfare of Livestock or Codes of Practice for Welfare of Dogs/ Cats. Their primary use was to consider a Section 9 “animal welfare” offence, which requires animals to be provided with certain needs. In this context the codes were used to provide evidence of the needs such as diet, normal behaviour required for each animal.

### ***Disputes between experts***

There was evidence of disputes between experts in the reports. For example some experts criticised the assessment methods used by other experts.

*“It is therefore impossible to say that this animal was not in pain because [XXXX] failed to note behavioural changes in an animal that was examined in such circumstances.”* (R1)

Eleven reports examined in this study referred to five cases that had been examined by more than one expert. Within these reports there were examples of disagreement between certain experts, about what constitutes suffering. For example when discussing the body condition of horses one expert said that the horses were *“in a state of unnecessary suffering due to their emaciated body condition”* (R13) whereas another expert argued that *“being thin or underweight is not of itself suffering”* (R29).

In another case (Reports 22, 23 and 27) there was disagreement about the significance of behaviour, skin changes and presence of anaemia with one expert, for example, commenting that *“I do not agree that anaemia must be present in order to prove suffering.”* (R23)

Some reports criticised the diagnosis methods used by other veterinarians. For example one expert criticised a list of adjectives (*“emaciated, very thin, thin, poor, lean, average, fair, good, very good, obese”*; R13) by another expert suggesting that the list *“has never been defined or validated, and means different things to different people”* (R29).

## Discussion

This study aimed to describe the approaches taken by veterinary experts to the assessment of unnecessary suffering. The authors are not aware of any previous study aimed at understanding the challenges with expert evidence in unnecessary suffering cases. There are some inevitable limitations arising from the relatively small sample size and non-random method taken to collate reports. Moreover, this study only looked at the reports without considering the court process or the outcomes. Despite these limitations this study has highlighted considerable variation in the criteria used to assess both the potential suffering and the suitability of actions taken by the keeper. Across the sample of reports it is possible to identify examples of more comprehensive reports that might help courts evaluate the evidence and hopefully reduce some of “ongoing contention and mutual criticisms” (Wooler, 2014).

Whilst the factual reporting of behaviour, physical appearance and laboratory results appeared relatively consistent between reports, there appeared to be significant variations in the approach taken by experts with regard to the assessment of suffering, assessment of the actions of the owner and the use of external references.

There was often no reporting of information on the likely severity (13/42 reports) and duration (13/42 reports) of harm caused to the animal. It seems reasonable to expect all reports to comment on the severity and duration of potential suffering even if the expert needs to state that insufficient evidence was provided on which to base an opinion. There was also variation in the assessment of mental or physical suffering. Given that the legislation (AWA, 2006) actually states that suffering *“means physical or mental suffering and related expressions shall be construed accordingly”* then both approaches seem relevant. In order to provide a comprehensive account it would also seem reasonable to recommend that the expert witness report should comment on both the physical harms and likely mental impacts so that the court has all available information.

There was variable consideration of the actions of the owner with thirteen reports not including any comments on the actions of the owner. The court ultimately is responsible for deciding upon the acceptability of actions of the owner. However, the technical expertise of the expert in most cases would be relevant in the formulation of view. In particular the expert could comment on the legitimacy of the potential *“purpose”* of the owner’s actions causing suffering or on the actions of a *“reasonably competent and humane”* owner in a similar situation.

Finally many experts appeared to rely solely on their existing veterinary knowledge and experience rather than using reference to external sources to support their evidence as advocated in the RCVS Code of Professional conduct (RCVS, 2015). For example a potential area for use of external reference is to use of standardised scoring systems, such as the body condition score for horses in the welfare code (DEFRA, 2009). Standardised welfare assessment protocols have been more widely available for several species (Blokhuys et al, 2010).

Some experts referred to a threshold or tipping point, implying that a certain severity or duration was necessary before suffering could be proven. The concept of a threshold is evident in some welfare science definitions (Table 1) by their use of such terms as “strong”, “intense”, “extended” or “prolonged”. In practice, prosecuting authorities may apply a pragmatic severity threshold before even considering a prosecution. However, Radford (2001) reported that the case law for the animal welfare legislation, preceding the AWA 2006, suggests that suffering itself does not need to be substantial nor prolonged. Furthermore the AWA definition of suffering contains no such threshold. Considering that a court has to decide whether the actions of the owner are reasonable in the context of the harm caused it would seem reasonable to remind experts that the purpose of describing the extent (severity and duration) of harm caused to the animal is to provide a context for assessing the actions of the owner. This is not necessarily enhanced by determining whether the suffering exceeds a poorly defined threshold.

Although this study was not specifically designed to systematically compare the reports from different experts, the eleven reports covering cases with more than one expert showed clear disagreements in the definition and assessment of suffering. Examination of further case reports from matched cases would be useful to define more precisely the areas of potential disagreement between experts.

## **Acknowledgements**

We would like to thank Paul Roger, Sophia Hepple and James Yeates for assistance in the collation of expert reports and discussing the findings.

## **References**

Anon (2006) Animal Welfare Act. Her Majesty's Stationery Office.

Anon (1911) Protection of Animals Act. Her Majesty's Stationery Office.

BATESON, P. (2011) Ethical debates about animal suffering and the use of animals in research. *Journal of Consciousness Studies* 18, 186-208.

- BENETATO, M. A., REISMAN, R. & MCCOBB, E. (2011) The veterinarian's role in animal cruelty cases. *Journal of the American Veterinary Medical Association* 238, 31-34
- BLOKHUIS, H.J., VEISSIER, I., MIELE M. & JONES B. (2010) The Welfare Quality® project and beyond: Safeguarding farm animal well-being. *Acta Agriculturae Scandinavica, Section A — Animal Science*. 60, 129-140
- CALLEY, D. (2011) Developing a common law of animal welfare: offences against animals and offences against person compared. *Crime, Law and Social Change* 55, 421-436
- CASELL, E.J. (1982) The nature of suffering and the goals of medicine. *The New England Journal of Medicine* 306, 639-645
- COOPER, J.E. & COOPER, M.E. (2008) Forensic veterinary medicine: a rapidly evolving discipline. *Forensic Science Medicine and Pathology* 4, 75-82
- DAWKINS M.S. (1985). The scientific basis for assessing suffering in animals. In *Defense of animals*. Ed. P. Singer. Basil Blackwell. pp 27-40
- DAWKINS M.S. (2008) The science of animal suffering. *Ethology* 114, 937-945
- DEPARTMENT FOR ENVIRONMENT, FOOD AND RURAL AFFAIRS (2009) *The Code of Practice for the Welfare of Horses, Ponies, Donkeys and their Hybrids*. PB13334
- FRASER, A.F. (1984) The behaviour of suffering in animals. *Applied Animal Behaviour Science* 13, 1-6
- FRASER, A.F. (1988) Animal suffering: the appraisal and control of depression and distress in live-stock. *Applied Animal Behaviour Science* 20, 127-133
- FRASER, D. & DUNCAN, I.J.H. (1998) 'Pleasures', 'pains' and animal welfare: toward a natural history of affect. *Animal Welfare* 7, 383-396
- MARTIN, D. (2013) Role of the expert witness. *Veterinary Record* 173 i-ii
- MASON, G. & MENDEL, M. (1993) Why is there no simple way of measuring animal welfare? *Animal Welfare* 2, 301-319
- MORTON, D.B., BURGHARDT, G.M. & SMITH, J.A. (1990) Animals, science, and ethics – Section III. Critical anthropomorphism, animal suffering, and the ecological context. *The Hastings centre report* 20, 13-19
- RADFORD, M. (2001) The nature of animal welfare. In *Animal welfare law in Britain: Regulation and responsibility*. Oxford University Press pp 262-288.
- ROYAL COLLEGE OF VETERINARY SURGEONS (2015) *Code of Professional Conduct for Veterinary Surgeons*. pp 106-117
- SHORT, C.E. (1998) Fundamentals of pain perception in animals. *Applied Animal Behaviour Science* 59, 125-133
- WEBSTER, J. (2005) Sentience, Sense and Suffering. In: *Animal welfare. Limping towards eden*. Blackwell Publishing, Oxford. pp. 46-62.
- WOOLER, S. (2014) The independent review of the prosecution activity of the Royal Society for the Prevention of Cruelty to Animals.  
<http://www.rspca.org.uk/webContent/staticImages/Downloads/WoolerReviewFinalSept2014.pdf>. Accessed November 17, 2015

WÜRBEL, H. (2009) The state of ethological approaches to the assessment of animal suffering and welfare. *Applied Animal Behaviour Science* 118, 105-107